



Taxonomic Paper

A cybercatalogue of American sand fly types (Diptera, Psychodidae, Phlebotominae) deposited at the Natural History Museum, London

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Abstract

Background

Sand flies (Diptera, Psychodidae, Phlebotominae) are biting flies involved in the transmission of pathogens, including the protozoan parasite *Leishmania* amongst human and non-human animals (Rangel and Lainson 2009).

New information

A total of 60 species of American Phlebotominae (Diptera: Psychodidae), distributed amongst 16 genera were studied. A checklist of the primary and secondary type specimens held at the Natural History Museum, London (NHMUK), is given and 968 photographs of the specimens and their labels are made available on a [Scratchpads](http://phlebotominaenhmtypes.myspecies.info) website <http://phlebotominaenhmtypes.myspecies.info>.

Keywords

Taxonomy, Sand fly, Neotropical, Nearctic, Phlebotominae, type catalogue, NHMUK

Introduction

There are approximately 1,000 valid described species of sand flies in the world, of which 530 are known to occur in the Americas (Shimabukuro et al. 2017).

The aim of this work is to provide a checklist of Phlebotominae types of the Neotropical and Nearctic regions held in the collections of the Natural History Museum, London (NHMUK formerly BMNH), together with electronic links to, scans of whole slides, plus detail images of the taxonomically informative morphological structures. This work updates the American portion of the 1990 checklist of types deposited at the NHMUK (Townsend and Lane 1990).

History

Owing to the small size and morphological homogeneity of phlebotomine sand flies, few species were described before the turn of the 20th century. Indeed little progress in their taxonomy was made until Adler and Theodor (1926) and Theodor (1932) drew attention to the utility of various internal structures (cibarium & spermathecae) for species differentiation. Currently, taxonomically valid species descriptions of phlebotomine sand flies still rely on adult morphology. Although newer molecular techniques are increasingly used for identifying species (Zapata et al. 2012), they have yet to be formally used as characters in species descriptions. Type specimens are confined to the adult stage, with few taxa described in the immature stages.

Significant donations to the NHMUK collection have come from: (i) Graham Bell Fairchild who worked on the Panamanian fauna in the 1950s and 60s; (ii) a number of early types described by Robert Newstead in the 1920s when he was a Professor at the Liverpool School of Tropical Medicine; (iii) and most significantly, the collection of Oskar Theodor, which the museum purchased in 1981 after his retirement from the University of Jerusalem. The NHMUK has also absorbed the specimen collections of the London School of Tropical Medicine and Hygiene (LSHTM).

The main body of the NHMUK Phlebotominae collection was assembled by Dr D.J. Lewis who, though not a member of staff, was based at the museum for 30 years (1956-1986) whilst in the employ of the Medical Research Council in London. All his material was mounted in Berlese media which is not a permanent mountant. There are many examples of deteriorating Lewis slides in the NHMUK collection (Fig. 1), as well as instances where Lewis remounted other authors' type specimens into Berlese. His distinctive handwriting and messy slides, often bearing multiple specimens, are instantly recognisable.

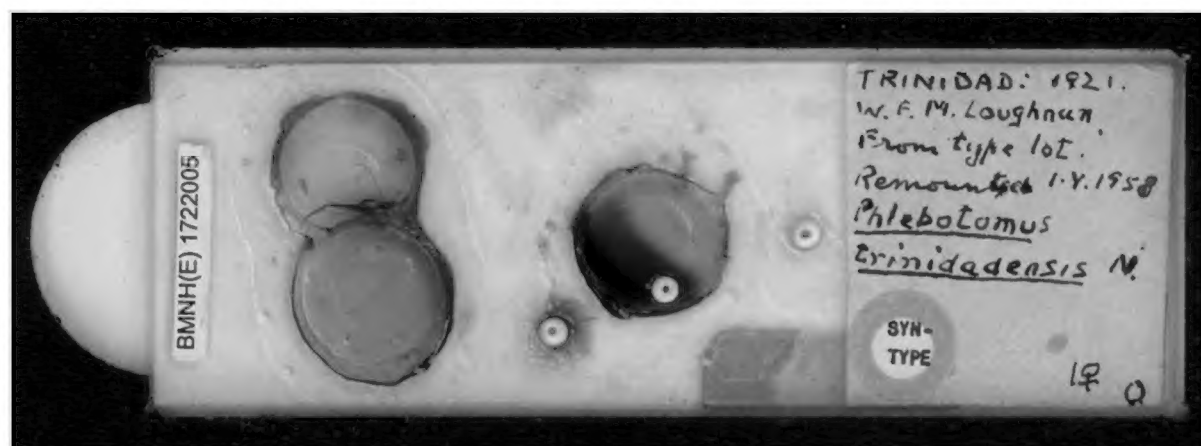


Figure 1. [doi](#)

Example of an R. Newstead type remounted into Berlese by D. J. Lewis, showing the typical darkening of the mountant as it deteriorates.

Taxonomic treatment

Phlebotominae taxonomy has a long history of differences in opinion amongst experts and various conflicting classification schemes. The current situation is no exception, with both classification of Young and Duncan (1994), which is based on the previous work of Lewis et al. (1977) and that of Galati (2003b) in use at the same time, for the New World fauna. For a comparison of how these two classifications relate to each other see Fig. 2.

Currently, the NHMUK collections are arranged according to Young and Duncan (1994), but we have used the Galati (2003b) naming systems here to reflect the current knowledge of the group.

In their guide to identification and distribution, Young and Duncan (1994) adopt the classification of Lewis et al. (1977) with only minor changes. They make it clear that their arrangement of taxa does not represent a phylogenetic analysis of the group and, aside from a few comments in the notes, give no information on the relationships between their subgeneric groups. It is clear that their groupings have been arrived at through a phenetic review of morphological characters with little focus on identifying any common ancestry between groups.

Lewis et al. (1977) proposed their classification at a time when those working on sand flies were faced with the choice between two family names, several subfamily names and, for some species, three possible generic names. Their aim was to create a stable general framework with flexible subdivisions into which, recent and future ideas on the evolutionary relationships within the group, could be assimilated. They present a review of the early literature on the group and, with reference to the International Code of Zoological Nomenclature (ICZN), proposed the use of the family name Psychodidae Newman 1834 and the subfamily name Phlebotominae Rondani 1840, proposals that have been more or less universally accepted. Their proposal for the use of just five genera (*Brumptomyia*, *Lutzomyia*, *Phlebotomus*, *Sergentomyia* and *Warileya*) now seems less successful.

best understanding of the evolutionary relationships within this important group (Galati 2003a, Galati 2003b).

There are some nomenclatural issues with the Galati classification as it stands at the present moment (see Shimabukuro et al. 2017). Within the classification a number of family group and genus group names are attributed to Artemiev from his 1991 work (Artemiev 1991). In this work, Artemiev does not accompany any of his new names with a description that states in words characters that are purported to differentiate the taxa, thus all his new names do not comply with ICZN Article 13.1.1 <http://www.iczn.org/iczn/index.jsp> and should be considered nomina nuda. Likewise, there are a large number of family group and genus group names in the classification attributed to Galati (1995), where she also fails to accompany any of her new names with a description that can be used to distinguish them. Galati lists the characters used, gives a polarised transformation series and maps the characters and taxa on to a cladogram, but this is not sufficient under the code to render the new names from her 1995 work available. In 2003, Galati updated her 1995 classification (Galati 2003b, Galati 2003a), this 2003 work contains extensive identification keys for all groups and any unavailable names should take authorship and date from this later act of establishment under ICZN articles 50 and 21.

Materials and methods

Checklist

The list contains information compiled from the examination of Nearctic and Neotropical species of sand flies from the Diptera Collection at the NHMUK.

Species are listed alphabetically, with genus and subgenus designations according to Shimabukuro et al. 2017. Links to the scratchpad entry and images for each specimen are given in the **eventRemarks** section of the checklist.

Readers familiar with the classification of Young and Duncan (1994) should refer to the scratchpads website <http://phlebotominaenhmtypes.myspecies.info> where the specimens have been arranged according to both classifications.

We have excluded from this catalogue two NHMUK specimens bearing “type” labels, for which we can find no record of the given species name in the literature. One labelled as the holotype of *Lutzomyia witremundoi* (author Feliciangeli), the other labelled as a paratype of *L. patiñoi* (authors Mangabeira & Galindo). It seems probable that these are unpublished manuscript names and are therefore unavailable under article 8 of the ICZN.

Specimen Images

Photographs were taken in the Sackler Biodiversity Imaging Laboratory (SBIL), at the NHMUK, with an Olympus BX63-CBH microscope equipped with a DP73 camera and

differential interference contrast (DIC) illumination. The images were edited in the Cellsens software and stacked images were produced by HeliconFocus 6 software.

Whole slide scans were generated using a SatScan instrument at x5 magnification and images were cropped and processed using the Inselect software, version 0.1.35, available from the Natural History Museum <https://naturalhistorymuseum.github.io/inselect>.

Data resources

Bibliography

Most of the original species descriptions are still under copyright to their original publisher. The bibliographical and historical database of scientific articles on leishmaniasis and sand flies hosted by the Laboratoire de Parasitologie at the University of Montpellier is an extremely useful resource <http://www.leishpub.univ-montp1.fr>.

Specimen Images

The specimen images are available on the NHMUK data portal: <https://doi.org/10.5519/0051226>.

The checklist, specimen data and specimen images are available on a Scratchpads website <http://phlebotominaenhmtypes.myspecies.info>.

Checklist

acanthobasis Fairchild & Hertig, 1952

Nomenclature:

Phlebotomus acanthobasis Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Materials

Paratypes:

- a. scientificName: *Pressatia acanthobasis* (Fairchild & Hertig, 1952); acceptedNameUsage: *Pressatia camposi* (Rodríguez, 1950); country: Panama; stateProvince: Colón; locality: Mojinga swamp; eventDate: 09-05-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/192>; sex: Female; catalogNumber: BMNHE1722073; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pressatia acanthobasis* (Fairchild & Hertig, 1952); acceptedNameUsage: *Pressatia camposi* (Rodríguez, 1950); country: Panama; stateProvince: Panamá; locality: Rio Majé, Charco el Toro; eventDate: 03-22-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/193>; sex: Male; catalogNumber: BMNHE1722074; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, Ecuador, Nicaragua, Panama

Notes: Synonym of *Pressatia camposi* (Rodríguez, 1950) Rodríguez 1950. Synonymised by Fairchild and Hertig 1958b.

***aclydifera* Fairchild & Hertig, 1952**

Nomenclature:

Phlebotomus aclydiferus Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Materials

Paratypes:

- a. scientificName: *Psathyromyia* (*Xiphopsathyromyia*) *aclydifera* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Colón; locality: Mojinga swamp, nr. Gatún; eventDate: 08-21-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/111>; sex: Female; catalogNumber: BMNHE1721992; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Psathyromyia* (*Xiphopsathyromyia*) *aclydifera* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Chiriquí; municipality: Barú; locality: Puerto Armuelles; eventDate: 06-09-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/112>; sex: Male; catalogNumber: BMNHE1721993; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Bolivia, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama

Notes: Valid species in *Psathyromyia* (*Xiphopsathyromyia*).

***anduzei* Rozeboom, 1942**

Nomenclature:

Phlebotomus anduzei Rozeboom, 1942 (Rozeboom 1942)

Materials

Syntypes:

- a. scientificName: *Nyssomyia anduzei* (Rozeboom, 1942); country: Venezuela; stateProvince: Bolívar; municipality: Gran Sabana; locality: Gran Sabana; year: 1941; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/187>; sex: Female; catalogNumber: BMNHE1722068; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Nyssomyia anduzei* (Rozeboom, 1942); country: Venezuela; stateProvince: Bolívar; municipality: Gran Sobana; locality: Gran Sobana; year: 1941; month: 12; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/239>; catalogNumber: BMNHE1722120; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Nyssomyia anduzei* (Rozeboom, 1942); country: Venezuela; stateProvince: Bolívar; municipality: Gran Sobana; locality: Gran Sobana; year: 1941; month: 12; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/240>; sex:

Female; catalogNumber: BMNHE1722121; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

- d. scientificName: *Nyssomyia anduzei* (Rozeboom, 1942); country: Venezuela; stateProvince: Bolívar; municipality: Gran Sobana; locality: Gran Sobana; year: 1941; month: 12; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/241>; sex: Female; catalogNumber: BMNHE1722122; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Nyssomyia anduzei* (Rozeboom, 1942); country: Venezuela; stateProvince: Bolívar; municipality: Gran Sobana; locality: Gran Sobana; year: 1941; month: 12; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/242>; catalogNumber: BMNHE1722123; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, Costa Rica, French Guiana, Panama, Peru, Venezuela

Notes: Valid species in *Nyssomyia*.

***aulari* Feliciangeli, Ordoñez & Manzanilla, 1984**

Nomenclature:

Lutzomyia aulari Feliciangeli, Ordoñez & Manzanilla, 1984 (Feliciangeli et al. 1984b)

Material

Holotype:

- a. scientificName: *Pintomyia (Pifanomyia) aulari* (Feliciangeli, Ordoñez & Manzanilla, 1984); country: Venezuela; stateProvince: Trujillo; locality: Loma Abajo; eventDate: 06-01-70; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/207>; sex: Male; catalogNumber: BMNHE1722088; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Venezuela

Notes: Valid species in *Pintomyia* (*Pifanomyia*).

***auraensis* Mangabeira, 1942**

Nomenclature:

Flebotomus auraensis Mangabeira, 1942 (Mangabeira 1942)

Material

Paratype:

- a. scientificName: *Trichophoromyia auraensis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aurá, em buraco de tatu.; year: 1940; month: 8; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/200>; sex: Male; catalogNumber: BMNHE1722081; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Peru, Surinam, Venezuela

Notes: Valid species in *Trichophoromyia*.

***bispinosus* Fairchild & Hertig, 1951**

Nomenclature:

Phlebotomus bispinosus Fairchild & Hertig, 1951 (Fairchild and Hertig 1951a)

Materials

Paratype:

- a. scientificName: *Psychodopygus bispinosus* (Fairchild & Hertig, 1951); country: Panama; stateProvince: Chiriquí; locality: La Victoria, Cerro Jefe; eventDate: 08-29-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/97>; sex: Female; catalogNumber: BMNHE1251325; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Allotype:

- a. scientificName: *Psychodopygus bispinosus* (Fairchild & Hertig, 1951); country: Panama; stateProvince: Chiriquí; locality: La Victoria, Cerro Jefe; eventDate: 08-30-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/98>; sex: Male; catalogNumber: BMNHE1251326; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Brazil, Colombia, Costa Rica, Ecuador, French Guiana, Guatemala, Honduras, Mexico, Nicaragua, Panama, Surinam

Notes: Valid species in *Psychodopygus*.

***botella* Fairchild & Hertig, 1961**

Nomenclature:

Phlebotomus botellus Fairchild & Hertig, 1961 (Fairchild and Hertig 1961)

Material

Paratype:

- a. scientificName: *Lutzomyia (Helcocyrtomyia) botella* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Chiriquí; locality: El Volcan; eventDate: 03-23-54; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/129>; sex: Female; catalogNumber: BMNHE1722010; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Panama

Notes: Valid species in *Lutzomyia (Helcocyrtomyia)*.

***brumpti* Larrousse, 1920**

Nomenclature:

Phlebotomus brumpti Larrousse, 1920 (Larrousse 1920)

Materials**Syntypes:**

- a. scientificName: *Brumptomyia brumpti* (Larrousse, 1920); country: Brazil; locality: Albuquerque; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/130>; sex: Female; catalogNumber: BMNHE1722011; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Brumptomyia brumpti* (Larrousse, 1920); country: Brazil; locality: Albuquerque; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/162>; sex: Male; catalogNumber: BMNHE1722043; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Argentina, Bolivia, Brazil

Notes: Valid species in *Brumptomyia*.

cayennensis braci* Lewis, 1967*Nomenclature:**

Lutzomyia cayennensis braci Lewis, 1967 (Lewis 1967)

Materials**Holotype:**

- a. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 12-18-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/147>; sex: Male; catalogNumber: BMNHE1722028; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Paratypes:

- a. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 18/12/64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/169>; sex: Female; catalogNumber: BMNHE1722050; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 18/12/64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/170>; sex: Female; catalogNumber: BMNHE1722051; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Stake Bay; eventDate: 12-16-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/225>; sex: Female; catalogNumber: BMNHE1722106; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 12-18-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/226>; sex:

- Male; catalogNumber: BMNHE1722107; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Stake Bay; eventDate: 12-16-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/227>; sex: Male; catalogNumber: BMNHE1722108; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
 - f. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Stake Bay; eventDate: 12-16-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/228>; sex: Male; catalogNumber: BMNHE1722109; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
 - g. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 12-18-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/229>; sex: Female; catalogNumber: BMNHE1722110; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
 - h. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 12-18-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/230>; sex: Male; catalogNumber: BMNHE1722111; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
 - i. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Stake Bay; eventDate: 12-16-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/231>; sex: Female; catalogNumber: BMNHE1722112; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
 - j. scientificName: *Micropygomyia (Micropygomyia) cayennensis braci* (Lewis, 1967); country: Cayman Islands; stateProvince: Cayman Brac; locality: Bamboo Bay; eventDate: 12-18-64; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/232>; sex: Male; catalogNumber: BMNHE1722113; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Cayman Islands

Notes: Valid species in *Micropygomyia (Micropygomyia)*.

***cayennensis hispaniolae* Fairchild & Trapido, 1950**

Nomenclature:

Phlebotomus cayennensis hispaniolae Fairchild & Trapido, 1950 (Fairchild and Trapido 1950)

Materials

Paratypes:

- a. scientificName: *Micropygomyia (Micropygomyia) cayennensis hispaniolae* (Fairchild & Trapido, 1950); country: Haiti; stateProvince: Nord; locality: La Voute, 4.8 miles from Cap-Haïtien on Limbe Rd.; eventDate: 06-09-49; eventRemarks: <http://>

- phlebotominaenhmtypes.myspecies.info/node/148; sex: Female; catalogNumber: BMNHE1722029; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Micropygomyia (Micropygomyia) cayennensis hispaniolae* (Fairchild & Trapido, 1950); country: Haiti; stateProvince: Nord; municipality: le Cap-Haïtien; locality: Milot, le Cap-Haïtien; eventDate: 06-09-49; eventRemarks: [http://](http://phlebotominaenhmtypes.myspecies.info/node/149)
phlebotominaenhmtypes.myspecies.info/node/149; sex: Male; catalogNumber: BMNHE1722030; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Micropygomyia (Micropygomyia) cayennensis hispaniolae* (Fairchild & Trapido, 1950); country: Dominican Republic; stateProvince: Hato Mayor; municipality: Sabana de la Mar; locality: Cacao plantation 6 km South of Sabana de la Mar; eventDate: 06-12-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/150>; sex: Female; catalogNumber: BMNHE1722031; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Micropygomyia (Micropygomyia) cayennensis hispaniolae* (Fairchild & Trapido, 1950); country: Haiti; stateProvince: Nord; municipality: le Cap-Haïtien; locality: Ruins of Pauline Bonaparte's palace East of town; eventDate: 06-09-49; eventRemarks: [http://](http://phlebotominaenhmtypes.myspecies.info/node/151)
phlebotominaenhmtypes.myspecies.info/node/151; sex: Female; catalogNumber: BMNHE1722032; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Micropygomyia (Micropygomyia) cayennensis hispaniolae* (Fairchild & Trapido, 1950); country: Haiti; stateProvince: Nord; municipality: le Cap-Haïtien; locality: Ruins of Pauline Bonaparte's palace East of town; eventDate: 06-09-49; eventRemarks: [http://](http://phlebotominaenhmtypes.myspecies.info/node/152)
phlebotominaenhmtypes.myspecies.info/node/152; sex: Male; catalogNumber: BMNHE1722033; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- f. scientificName: *Micropygomyia (Micropygomyia) cayennensis hispaniolae* (Fairchild & Trapido, 1950); country: Dominican Republic; stateProvince: Santiago; locality: Santiago area; eventDate: 06-14-49; eventRemarks: [http://phlebotominaenhmtypes.myspecies.info/](http://phlebotominaenhmtypes.myspecies.info/node/153)
[node/153](http://phlebotominaenhmtypes.myspecies.info/node/153); sex: Male; catalogNumber: BMNHE1722034; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Dominican Republic, Haiti

Notes: Valid species in *Micropygomyia (Micropygomyia)*.

***cayennensis jamaicensis* Fairchild & Trapido, 1950**

Nomenclature:

Phlebotomus cayennensis jamaicensis Fairchild & Trapido, 1950 (Fairchild and Trapido 1950)

Material

Paratype:

- a. scientificName: *Micropygomyia (Micropygomyia) cayennensis jamaicensis* (Fairchild & Trapido, 1950); country: Jamaica; stateProvince: Kingston; locality: Rockfort, St Andrew parish, Kingston; eventDate: 05-20-49; eventRemarks: [http://](http://phlebotominaenhmtypes.myspecies.info/node/156)
phlebotominaenhmtypes.myspecies.info/node/156; sex: Male; catalogNumber: BMNHE1722037; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Jamaica

Notes: Valid species in *Micropygomyia* (*Micropygomyia*).

***cayennensis maciasi* Fairchild & Hertig, 1948**

Nomenclature:

Phlebotomus cayennensis maciasi Fairchild & Hertig, 1948 (Fairchild and Hertig 1948)

Materials

Paratypes:

- a. scientificName: *Micropygomyia* (*Micropygomyia*) *cayennensis maciasi* (Fairchild & Hertig, 1948); country: Mexico; stateProvince: México; municipality: Zumpango; locality: Zumpango; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/154>; sex: Female; catalogNumber: BMNHE1722035; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Micropygomyia* (*Micropygomyia*) *cayennensis maciasi* (Fairchild & Hertig, 1948); country: Guatemala; stateProvince: Escuintla; municipality: San José; locality: San José; eventDate: 06-03-45; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/155>; sex: Female; catalogNumber: BMNHE1722036; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Guatemala, Mexico

Notes: Valid species in *Micropygomyia* (*Micropygomyia*).

***cayennensis puertoricensis* Fairchild & Hertig, 1948**

Nomenclature:

Phlebotomus cayennensis puertoricensis Fairchild & Hertig, 1948 (Fairchild and Hertig 1948)

Material

Paratype:

- a. scientificName: *Micropygomyia* (*Micropygomyia*) *cayennensis puertoricensis* (Fairchild & Hertig, 1948); country: Puerto Rico; stateProvince: Lares; locality: Lares; eventDate: 07-03-47; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/159>; sex: Female; catalogNumber: BMNHE1722040; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Puerto Rico

Notes: Valid species in *Micropygomyia* (*Micropygomyia*).

***coutinhoi* Mangabeira, 1942**

Nomenclature:

Flebotomus coutinhoi Mangabeira, 1942 (Mangabeira 1942)

Material*Paratype:*

- a. scientificName: *Psathyromyia* (*Forattiniella*) *coutinhoi* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Asura; year: 1940; month: 8; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/104>; sex: Male; catalogNumber: BMNHE1721985; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Peru

Notes: Valid species in *Psathyromyia* (*Forattiniella*).

cubensis* Fairchild & Trapido, 1950*Nomenclature:**

Phlebotomus cubensis Fairchild & Trapido, 1950 (Fairchild and Trapido 1950)

Materials*Paratypes:*

- a. scientificName: *Micropygomyia* (*Micropygomyia*) *cubensis* (Fairchild & Trapido, 1950); country: Cuba; stateProvince: Camagüey; locality: Camagüey; eventDate: 05-30-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/160>; sex: Female; catalogNumber: BMNHE1722041; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Micropygomyia* (*Micropygomyia*) *cubensis* (Fairchild & Trapido, 1950); country: Cuba; stateProvince: Pinar del Río; municipality: Viñales; locality: San Vicente, Viñales; eventDate: 06-04-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/161>; sex: Male; catalogNumber: BMNHE1722042; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Micropygomyia* (*Micropygomyia*) *cubensis* (Fairchild & Trapido, 1950); country: Cuba; stateProvince: Camagüey; locality: spelling on slide "Camaguay"; eventDate: 05-30-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/233>; sex: Female; catalogNumber: BMNHE1722114; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Micropygomyia* (*Micropygomyia*) *cubensis* (Fairchild & Trapido, 1950); country: Cuba; stateProvince: Matanzas; locality: Ceiba Mocha; eventDate: 06-02-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/234>; catalogNumber: BMNHE1722115; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Micropygomyia* (*Micropygomyia*) *cubensis* (Fairchild & Trapido, 1950); country: Cuba; stateProvince: Camagüey; locality: spelling on slide "Camaguay"; eventDate: 05-30-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/235>; sex: Male; catalogNumber: BMNHE1722116; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Cuba, United States of America

Notes: Valid species in *Micropygomyia* (*Micropygomyia*).

dasymera* Fairchild & Hertig, 1961*Nomenclature:**

Phlebotomus dasymerus Fairchild & Hertig, 1961 (Fairchild and Hertig 1961)

Materials**Paratypes:**

- a. scientificName: *Psathyromyia* (*Psathyromyia*) *dasymera* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Colón; locality: Juan Mina; eventDate: 11-29-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/93>; sex: Male; catalogNumber: BMNHE1251321; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Psathyromyia* (*Psathyromyia*) *dasymera* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Panamá; locality: Rio Majé, Charco el Toro; eventDate: 03-22-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/94>; sex: Male; catalogNumber: BMNHE1251322; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Psathyromyia* (*Psathyromyia*) *dasymera* (Fairchild & Hertig, 1961); country: Panama; locality: Canal zone, Camp Piña; eventDate: 03-06-54; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/95>; sex: Female; catalogNumber: BMNHE1251323; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Psathyromyia* (*Psathyromyia*) *dasymera* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Colón; locality: Mojinga swamp; eventDate: 07-24-54; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/96>; sex: Female; catalogNumber: BMNHE1251324; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Brazil, Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama, Venezuela

Notes: Valid species in *Psathyromyia* (*Psathyromyia*).

del-pozoi* Vargas & Díaz-Nájera, 1953*Nomenclature:**

Phlebotomus del-pozoi Vargas & Díaz-Nájera, 1953 (Vargas and Díaz Nájera 1953)

Materials**Paratypes:**

- a. scientificName: *Dampfomyia delpozoi* (Vargas & Díaz-Nájera, 1953); country: Mexico; stateProvince: Chiapas; locality: Finca El Vergel; eventDate: 05-28-35; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/261>; sex: Female; catalogNumber: BMNHE1722142; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Dampfomyia delpozoi* (Vargas & Díaz-Nájera, 1953); country: Mexico; stateProvince: Chiapas; locality: Finca El Vergel; eventDate: 05-28-35; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/262>; sex: Female; catalogNumber: BMNHE1722143; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Guatemala, Mexico

Notes: Valid species in *Dampfomyia*.

***duppyorum* Fairchild & Trapido, 1950**

Nomenclature:

Phlebotomus duppyorum Fairchild & Trapido, 1950 (Fairchild and Trapido 1950)

Materials

Paratypes:

- a. scientificName: *Micropygomyia (Micropygomyia) duppyorum* (Fairchild & Trapido, 1950); country: Jamaica; stateProvince: Manchester; locality: Melrose Hill, nr. Williams Field; eventDate: 05-25-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/189>; sex: Female; catalogNumber: BMNHE1722070; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Micropygomyia (Micropygomyia) duppyorum* (Fairchild & Trapido, 1950); country: Jamaica; stateProvince: Manchester; locality: Melrose Hill, nr. Williams Field; eventDate: 05-25-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/190>; sex: Male; catalogNumber: BMNHE1722071; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Micropygomyia (Micropygomyia) duppyorum* (Fairchild & Trapido, 1950); country: Jamaica; stateProvince: Manchester; locality: Melrose Hill, nr. Williams Field.; eventDate: 05-25-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/236>; sex: Female; catalogNumber: BMNHE1722117; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Micropygomyia (Micropygomyia) duppyorum* (Fairchild & Trapido, 1950); country: Jamaica; stateProvince: Saint Catherine; locality: nr. Springvale; eventDate: 05-21-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/237>; sex: Male; catalogNumber: BMNHE1722118; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Micropygomyia (Micropygomyia) duppyorum* (Fairchild & Trapido, 1950); country: Jamaica; stateProvince: Manchester; locality: Manchester area; eventDate: 05-25-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/238>; catalogNumber: BMNHE1722119; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Jamaica

Notes: Valid species in *Micropygomyia (Micropygomyia)*.

***dysponeta* Fairchild & Hertig, 1952**

Nomenclature:

Phlebotomus dysponeta Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Materials*Paratypes:*

- a. scientificName: *Pressatia dysponeta* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Panamá; locality: Pacora; eventDate: 08-13-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/194>; sex: Female; catalogNumber: BMNHE1722075; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pressatia dysponeta* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Panamá; locality: Pacora; eventDate: 08-13-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/195>; sex: Male; catalogNumber: BMNHE1722076; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, Colombia, Costa Rica, Ecuador, Panama, Venezuela

Notes: Valid species in *Pressatia*.

evansi* Nuñez-Tovar, 1924*Nomenclature:**

Phlebotomus evansi Nuñez-Tovar, 1924 (Nuñez-Tovar 1924)

Materials*Syntypes:*

- a. scientificName: *Pintomyia (Pifanomyia) evansi* (Nuñez-Tovar, 1924); country: Venezuela; year: 1922; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/208>; sex: Male; catalogNumber: BMNHE1722089; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pintomyia (Pifanomyia) evansi* (Nuñez-Tovar, 1924); country: Venezuela; year: 1922; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/210>; sex: Male; catalogNumber: BMNHE1722091; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Peru, Venezuela

Notes: Valid species in *Pintomyia (Pifanomyia)*.

flochi* Abonnenc & Chassignet, 1948*Nomenclature:**

Phlebotomus flochi Abonnenc & Chassignet, 1948 (Abonnenc and Chassignet 1948)

Material*Holotype:*

- a. scientificName: *Trichophoromyia flochi* (Abonnenc & Chassignet, 1948); country: French Guiana; locality: Baduel; year: 1947; month: 12; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/257>; sex: Male; catalogNumber: BMNHE1722138; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, French Guiana

Notes: Valid species in *Trichophoromyia*.

***gasti* Sherlock, 1962**

Nomenclature:

Phlebotomus gasti Sherlock, 1962 (Sherlock 1962)

Materials

Paratypes:

- a. scientificName: *Evandromyia (Aldamyia) gasti* (Sherlock, 1962); acceptedNameUsage: *Evandromyia (Aldamyia) walkeri* (Newstead, 1914); country: Colombia; stateProvince: Santander; municipality: San Vicente de Chucurí; locality: Soledad, San Vicente de Chucurí; eventDate: 08-16-74; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/215>; sex: Male; catalogNumber: BMNHE1722096; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Evandromyia (Aldamyia) gasti* (Sherlock, 1962); acceptedNameUsage: *Evandromyia (Aldamyia) walkeri* (Newstead, 1914); country: Colombia; stateProvince: Santander; municipality: San Vicente de Chucurí; locality: Soledad, San Vicente de Chucurí; eventDate: 16/08/44; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/216>; sex: Male; catalogNumber: BMNHE1722097; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Panama, Peru, Trinidad and Tobago, Venezuela

Notes: Synonym of *Evandromyia (Aldamyia) walkeri* (Newstead, 1914). Synonymised by Young 1979.

***gonzalo*i Ogusuku, Canales & Pérez, 1997**

Nomenclature:

*Lutzomyia gonzalo*i Ogusuku, Canales & Pérez, 1997 (Ogusuku et al. 1997)

Materials

Paratypes:

- a. scientificName: *Lutzomyia (Helcocyrtomyia) gonzalo*i Ogusuku, Canales & Pérez, 1997; country: Peru; stateProvince: Huánuco; municipality: Huamalés; locality: Monzon, Paucacu; eventDate: 05-22-97; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/131>; sex: Male; catalogNumber: BMNHE1722012; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Lutzomyia (Helcocyrtomyia) gonzalo*i Ogusuku, Canales & Pérez, 1998; country: Peru; stateProvince: Huánuco; municipality: Huamalés; locality: Monzon, Paucacu; eventDate: 05-22-97; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/132>; sex: Female; catalogNumber: BMNHE1722013; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Peru

Notes: Valid species in *Lutzomyia* (*Helcocyrtomyia*).

***hansoni* Fairchild & Hertig, 1961**

Nomenclature:

Phlebotomus hansonii Fairchild & Hertig, 1961 (Fairchild and Hertig 1961)

Materials

Paratypes:

- a. scientificName: *Migonemyia* (*Blancasmyia*) *hansonii* (Fairchild & Hertig, 1961); acceptedNameUsage: *Migonemyia* (*Blancasmyia*) *gorbitzi* (Blancas, 1960); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 06-19-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/116>; sex: Female; catalogNumber: BMNHE1721997; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Migonemyia* (*Blancasmyia*) *hansonii* (Fairchild & Hertig, 1961); acceptedNameUsage: *Migonemyia* (*Blancasmyia*) *gorbitzi* (Blancas, 1960); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 06-19-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/117>; sex: Female; catalogNumber: BMNHE1721998; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, Ecuador, Panama, Peru

Notes: Synonym of *Migonemyia* (*Blancasmyia*) *gorbitzi* (Blancas, 1959) Blancas 1959. Synonymised by Christensen and Rutledge 1973.

***hartmanni* Fairchild & Hertig, 1957**

Nomenclature:

Phlebotomus hartmanni Fairchild & Hertig, 1957 (Fairchild and Hertig 1957)

Materials

Paratypes:

- a. scientificName: *Lutzomyia* (*Helcocyrtomyia*) *hartmanni* (Fairchild & Hertig, 1957); country: Panama; locality: Cerro Campana; eventDate: 04-24-52; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/126>; sex: Male; catalogNumber: BMNHE1722007; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Lutzomyia* (*Helcocyrtomyia*) *hartmanni* (Fairchild & Hertig, 1957); country: Panama; locality: Cerro Campana; eventDate: 02-10-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/127>; sex: Female; catalogNumber: BMNHE1722008; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru

Notes: Valid species in *Lutzomyia* (*Helcocyrtomyia*).

inpai* Young & Arias, 1977*Nomenclature:**

Lutzomyia inpai Young & Arias, 1977 (Young and Arias 1977)

Materials**Paratypes:**

- a. scientificName: *Evandromyia* (*Evandromyia*) *inpai* (Young & Arias, 1977); country: Brazil; stateProvince: Amazonas State; locality: Manaus, Estrada Torquato Tapajos, km 54 (east of Manaus); eventDate: 10-21-75; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/113>; sex: Female; catalogNumber: BMNHE1721994; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Evandromyia* (*Evandromyia*) *inpai* (Young & Arias, 1977); country: Brazil; stateProvince: Amazonas State; locality: Manaus, Estrada Torquato Tapajos, km 54 (east of Manaus); eventDate: 10-21-75; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/114>; sex: Male; catalogNumber: BMNHE1721995; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, Venezuela

Notes: Valid species in *Evandromyia* (*Evandromyia*).

isovespertilionis* Fairchild & Hertig, 1958*Nomenclature:**

Phlebotomus isovespertilionis Fairchild & Hertig, 1958 (Fairchild and Hertig 1958a)

Materials**Paratypes:**

- a. scientificName: *Dampfomyia* (*Coromyia*) *isovespertilionis* (Fairchild & Hertig, 1958); country: Panama; eventDate: 06-20-56; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/105>; sex: Male; catalogNumber: BMNHE1721986; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Dampfomyia* (*Coromyia*) *isovespertilionis* (Fairchild & Hertig, 1958); country: Panama; eventDate: 06-20-56; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/106>; sex: Male; catalogNumber: BMNHE1721987; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Dampfomyia* (*Coromyia*) *isovespertilionis* (Fairchild & Hertig, 1958); country: Panama; eventDate: 06-20-56; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/107>; sex: Male; catalogNumber: BMNHE1721988; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Dampfomyia* (*Coromyia*) *isovespertilionis* (Fairchild & Hertig, 1958); country: Panama; eventDate: 06-20-56; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/108>; sex: Male; catalogNumber: BMNHE1721989; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Dampfomyia* (*Coromyia*) *isovespertilionis* (Fairchild & Hertig, 1958); country: Panama; eventDate: 06-20-56; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/109>

- phlebotominaenhmtypes.myspecies.info/node/109; sex: Male; catalogNumber: BMNHE1721990; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- f. scientificName: *Dampfomyia (Coromyia) isovespertilionis* (Fairchild & Hertig, 1958); country: Panama; locality: K-19; eventDate: 07-24-56; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/166>; sex: Male; catalogNumber: BMNHE1722047; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, Panama

Notes: Valid species in *Dampfomyia (Coromyia)*.

***lainsoni* Fraiha & Ward, 1974**

Nomenclature:

Psychodopygus lainsoni Fraiha & Ward, 1974 (Fraiha and Ward 1974)

Materials

Paratypes:

- a. scientificName: *Psychodopygus lainsoni* (Fraiha & Ward, 1974); country: Brazil; stateProvince: Pará; locality: km 46 Altamira to Itaituba road, Transamazonia highway; eventDate: 08-21-71; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/196>; sex: Female; catalogNumber: BMNHE1722077; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Psychodopygus lainsoni* (Fraiha & Ward, 1974); country: Brazil; stateProvince: Pará; locality: km 46 Altamira to Itaituba road, Transamazonia highway; year: 1971; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/197>; sex: Male; catalogNumber: BMNHE1722078; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Psychodopygus lainsoni* (Fraiha & Ward, 1974); country: Brazil; stateProvince: Pará; locality: km 46 Altamira to Itaituba road, Transamazonia highway; eventDate: 08-21-71; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/198>; sex: Female; catalogNumber: BMNHE1722079; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Psychodopygus lainsoni* (Fraiha & Ward, 1974); country: Brazil; stateProvince: Pará; locality: km 46 Altamira to Itaituba road, Transamazonia highway; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/199>; sex: Male; catalogNumber: BMNHE1722080; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Peru

Notes: Valid species in *Psychodopygus*.

***lewisi* Feliciangeli, Ordoñez & Fernández, 1984**

Nomenclature:

Lutzomyia lewisi Feliciangeli, Ordoñez & Fernández, 1984 (Feliciangeli et al. 1984a)

Material*Holotype:*

- a. scientificName: *Micropygomyia (Micropygomyia) lewisi* (Feliciangeli, Ordoñez & Fernández, 1984); country: Venezuela; stateProvince: Cojedes; locality: La Vâquira; eventDate: 06-20-77; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/103>; sex: Female; catalogNumber: BMNHE1721984; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Venezuela

Notes: Valid species in *Micropygomyia (Micropygomyia)*.

lumbrerasi* Ogosuku, Perez, Davies & Villaseca, 1996*Nomenclature:**

Warileya lumbrerasi Ogosuku, Perez, Davies & Villaseca, 1996 (Ogosuku et al. 1996)

Materials*Paratypes:*

- a. scientificName: *Warileya lumbrerasi* Ogosuku, Perez, Davies & Villaseca, 1996; country: Peru; stateProvince: Piura; municipality: Huancabamba; locality: El Higueron; eventDate: 02-21-93; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/99>; sex: Female; catalogNumber: BMNHE1721980; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Warileya lumbrerasi* Ogosuku, Perez, Davies & Villaseca, 1996; country: Peru; stateProvince: Piura; municipality: Huancabamba; locality: El Higueron; eventDate: 05-23-92; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/100>; sex: Male; catalogNumber: BMNHE1721981; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Peru

Notes: Valid species in *Warileya*.

monzonensis* Ogosuku, Canales & Pérez, 1997*Nomenclature:**

Lutzomyia monzonensis Ogosuku, Canales & Pérez, 1997 (Ogosuku et al. 1997)

Materials*Paratypes:*

- a. scientificName: *Lutzomyia (Helcocyrtomyia) monzonensis* Ogosuku, Canales & Pérez, 1997; country: Peru; stateProvince: Huánuco; municipality: Huamalíes; locality: Monzon, Paucacu; eventDate: 05-22-97; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/133>; sex: Female; catalogNumber: BMNHE1722014; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

- b. scientificName: *Lutzomyia (Helcocyrtomyia) monzonensis* Ogusuku, Canales & Pérez, 1998; country: Peru; stateProvince: Huánuco; municipality: Huamalíes; locality: Monzon, Paucacu; eventDate: 05-22-97; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/145>; sex: Male; catalogNumber: BMNHE1722026; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Peru

Notes: Valid species in *Lutzomyia (Helcocyrtomyia)*.

***odax* Fairchild & Hertig, 1961**

Nomenclature:

Phlebotomus odax Fairchild & Hertig, 1961 (Fairchild and Hertig 1961)

Materials

Paratypes:

- a. scientificName: *Pintomyia (Pifanomyia) odax* (Fairchild & Hertig, 1961); country: Honduras; stateProvince: Atlántida; municipality: Tela; locality: Lancetilla Valley, Tela; eventDate: 06/01/54; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/171>; sex: Female; catalogNumber: BMNHE1722052; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pintomyia (Pifanomyia) odax* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Bocas del Toro; locality: Finca Nievecita, Almirante; eventDate: 17/06/50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/173>; sex: Male; catalogNumber: BMNHE1722054; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Pintomyia (Pifanomyia) odax* (Fairchild & Hertig, 1961); country: Honduras; stateProvince: Atlántida; municipality: Tela; locality: Lancetilla Valley, Tela; eventDate: 23/12/53; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/174>; sex: Female; catalogNumber: BMNHE1722055; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, Costa Rica, French Guiana, Guatemala, Honduras, Nicaragua, Panama, Venezuela

Notes: Valid species in *Pintomyia (Pifanomyia)*.

***oligodonta* Young, Pérez & Romero, 1985**

Nomenclature:

Lutzomyia oligodonta Young, Pérez & Romero, 1985 (Young et al. 1985)

Material

Paratype:

- a. scientificName: *Oligodontomyia oligodonta* (Young, Pérez & Romero, 1985); country: Peru; stateProvince: Lima; locality: Cocachacra; eventDate: 01/05/63; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/175>

[p://phlebotominaenhmtypes.myspecies.info/node/217](http://phlebotominaenhmtypes.myspecies.info/node/217); sex: Male; catalogNumber: BMNHE1722098; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Peru

Notes: Valid species in *Oligodontomyia*.

***olmeca novica* Young & Arias, 1982**

Nomenclature:

Lutzomyia olmeca novica Young & Arias, 1982 (Young and Arias 1982)

Materials

Paratypes:

- a. scientificName: *Bichromomyia olmeca novica* (Young & Arias, 1982); country: Brazil; stateProvince: Amazonas; locality: 43km NE Manaus, at Campinas; eventDate: 03-21-79; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/185>; sex: Female; catalogNumber: BMNHE1722066; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Bichromomyia olmeca novica* (Young & Arias, 1982); country: Brazil; stateProvince: Amazonas; locality: 25km E of Manaus, Ducke Reserve; eventDate: 16-19/03/1979; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/186>; sex: Male; catalogNumber: BMNHE1722067; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, Peru

Notes: Valid species in *Bichromomyia*.

***olmeca olmeca* Vargas & Díaz-Nájera, 1959**

Nomenclature:

Phlebotomus olmecus Vargas & Díaz-Nájera, 1959 (Vargas and Díaz Nájera 1959)

Material

Allotype:

- a. scientificName: *Bichromomyia olmeca olmeca* (Vargas & Díaz-Nájera, 1959); country: Mexico; stateProvince: Tabasco; municipality: Teapa; locality: Sta A-0; eventDate: 12-16-53; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/91>; sex: Female; catalogNumber: BMNHE1251319; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua

Notes: Valid species in *Bichromomyia*.

oresbia* (Fairchild & Hertig, 1961)*Nomenclature:**

Phlebotomus oresbia Fairchild & Hertig, 1961 (Fairchild and Hertig 1961)

Material**Paratype:**

- a. scientificName: *Pintomyia* (*Pifanomyia*) *oresbia* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Chiriquí; municipality: Renacimiento; locality: Rio Candela, Chiriquí; eventDate: 11/08/51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/172>; sex: Female; catalogNumber: BMNHE1722053; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Costa Rica, Panama

Notes: Valid species in *Pintomyia* (*Pifanomyia*).

peruensis* Shannon, 1929*Nomenclature:**

Phlebotomus peruensis Shannon, 1929 (Shannon 1929)

Material**Syntype:**

- a. scientificName: *Lutzomyia* (*Helcocyrtomyia*) *peruensis* (Shannon, 1929); country: Peru; stateProvince: Lima; locality: Matucana; eventDate: 06-19-28; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/258>; sex: Male; catalogNumber: BMNHE1722139; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Peru

Notes: Valid species in *Lutzomyia* (*Helcocyrtomyia*).

phlebotomanica* Hertig, 1948*Nomenclature:**

Warileya phlebotomanica Hertig, 1948 (Hertig 1948)

Materials**Paratypes:**

- a. scientificName: *Warileya phlebotomanica* Hertig, 1948; country: Peru; stateProvince: Lima; municipality: Huarochiri; locality: Acequia cueva, Matucana; eventDate: 08-25-45; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/163>; sex: Female; catalogNumber: BMNHE1722044; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Warileya phlebotomanica* Hertig, 1949; country: Peru; stateProvince: Lima; municipality: Huarochiri; locality: Rio Rimac, Matucana; month: 8; day: 23;

eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/164>; sex: Female;
 catalogNumber: BMNHE1722045; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Ecuador, Peru

Notes: Valid species in *Warileya*.

***pia* Fairchild & Hertig, 1961**

Nomenclature:

Phlebotomus pius Fairchild & Hertig, 1961 (Fairchild and Hertig 1961)

Materials

Paratypes:

- a. scientificName: *Pintomyia (Pifanomyia) pia* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Chiriqui; locality: Lagunas del Volcán; eventDate: 05-19-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/222>; sex: Male; catalogNumber: BMNHE1722103; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pintomyia (Pifanomyia) pia* (Fairchild & Hertig, 1961); country: Panama; stateProvince: Chiriqui; locality: Sta. Clara, El Volcan; eventDate: 08-11-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/223>; sex: Male; catalogNumber: BMNHE1722104; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Colombia, Costa Rica, Panama, Peru, Venezuela

Notes: Valid species in *Pintomyia (Pifanomyia)*.

***pinottii* Damasceno & Arouck, 1956**

Nomenclature:

Flebotomus pinottii Damasceno & Arouck, 1956 (Damasceno and Arouck 1956)

Material

Paratype:

- a. scientificName: *Evandromyia (Evandromyia) pinottii* (Damasceno & Arouck, 1956); country: Brazil; locality: Rio Acará; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/115>; sex: Male; catalogNumber: BMNHE1721996; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, French Guiana, Venezuela

Notes: Valid species in *Evandromyia (Evandromyia)*.

quasitownsendi* Osorno, Osorno-Mesa & Morales, 1972*Nomenclature:**

Lutzomyia quasitownsendi Osorno, Osorno-Mesa & Morales, 1972 (Osorno et al. 1972)

Materials**Paratypes:**

- a. scientificName: *Pintomyia (Pifanomyia) quasitownsendi* (Osorno, Osorno-Mesa & Morales, 1972); country: Colombia; stateProvince: Santander; municipality: Socorro; eventDate: 12-09-67; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/211>; sex: Male; catalogNumber: BMNHE1722092; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pintomyia (Pifanomyia) quasitownsendi* (Osorno, Osorno-Mesa & Morales, 1972); country: Colombia; stateProvince: Santander; municipality: Barbosa; eventDate: 10-30-68; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/212>; sex: Female; catalogNumber: BMNHE1722093; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Pintomyia (Pifanomyia) quasitownsendi* (Osorno, Osorno-Mesa & Morales, 1972); country: Colombia; stateProvince: Santander; municipality: Barbosa; eventDate: 10-30-68; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/248>; sex: Female; catalogNumber: BMNHE1722129; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Pintomyia (Pifanomyia) quasitownsendi* (Osorno, Osorno-Mesa & Morales, 1972); country: Colombia; stateProvince: Santander; municipality: Güepsa; eventDate: 06-22-67; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/249>; sex: Female; catalogNumber: BMNHE1722130; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia

Notes: Valid species in *Pintomyia (Pifanomyia)*.

richardwardi* Ready & Fraiha, 1981*Nomenclature:**

Lutzomyia richardwardi Ready & Fraiha, 1981 (Ready and Fraiha 1981)

Materials**Paratypes:**

- a. scientificName: *Nyssomyia richardwardi* (Ready & Fraiha, 1981); country: Brazil; stateProvince: Pará; locality: Altamira-Itaituba rd km 43; eventDate: 08-21-71; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/92>; sex: Female; catalogNumber: BMNHE1251320; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Nyssomyia richardwardi* (Ready & Fraiha, 1981); country: Brazil; stateProvince: Pará; locality: km 43 Altamira to Itaituba rd; eventDate: 08-21-71; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/182>; sex: Female;

catalogNumber: BMNHE1722063; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

- c. scientificName: *Nyssomyia richardwardi* (Ready & Fraiha, 1981); country: Brazil; stateProvince: Pará; locality: km 43 Altamira to Itaituba rd; eventDate: 08-21-71; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/183>; sex: Female; catalogNumber: BMNHE1722064; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Ecuador, Peru

Notes: Valid species in *Nyssomyia*.

***rosabali* Fairchild & Hertig, 1956**

Nomenclature:

Phlebotomus rosabali Fairchild & Hertig, 1956 (Fairchild and Hertig 1956)

Materials

Paratypes:

- a. scientificName: *Dampfomyia (Dampfomyia) rosabali* (Fairchild & Hertig, 1956); country: Costa Rica; stateProvince: Puntarenas; locality: Barranca, Finca Socorrito; eventDate: 12-17-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/110>; sex: Female; catalogNumber: BMNHE1721991; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Dampfomyia (Dampfomyia) rosabali* (Fairchild & Hertig, 1956); country: Colombia; stateProvince: Cauca; municipality: Bolívar; locality: Bolívar (Cauca); eventDate: 23/01/44; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/167>; sex: Male; catalogNumber: BMNHE1722048; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, Panama

Notes: Valid species in *Dampfomyia (Dampfomyia)*.

***rostrans* Summers, 1912**

Nomenclature:

Phlebotomus rostrans Summers, 1912 (Summers 1912)

Materials

Paralectotypes:

- a. scientificName: *Trichophoromyia rostrans* (Summers, 1912); locality: Rio Javari, Peru/Brazil border; year: 1912; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/201>; sex: Male; catalogNumber: BMNHE1722082; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Trichophoromyia rostrans* (Summers, 1912); locality: Rio Javari, Peru/Brazil border; year: 1912; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/>

[node/202](#); sex: Female; catalogNumber: BMNHE1722083; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

- c. scientificName: *Trichophoromyia rostrans* (Summers, 1912); locality: Rio Javari, Peru/Brazil border; year: 1912; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/243>; sex: Female; catalogNumber: BMNHE1722124; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Lectotype:

- a. scientificName: *Trichophoromyia rostrans* (Summers, 1912); locality: Rio Javari, Peru/Brazil border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/244>; sex: Female; catalogNumber: BMNHE1722125; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil

Notes: Valid species in *Trichophoromyia*. Lectotype designated by Lewis 1967b.

***rotundipennis* Fairchild & Hertig, 1951**

Nomenclature:

Warileya rotundipennis Fairchild & Hertig, 1951 (Fairchild and Hertig 1951b)

Materials

Paratypes:

- a. scientificName: *Warileya rotundipennis* Fairchild & Hertig, 1951; country: Panama; locality: Cerro Campana; eventDate: 08-24-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/101>; sex: Female; catalogNumber: BMNHE1721982; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Warileya rotundipennis* Fairchild & Hertig, 1951; country: Panama; locality: Cerro Campana; eventDate: 08-24-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/102>; sex: Male; catalogNumber: BMNHE1721983; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Warileya rotundipennis* Fairchild & Hertig, 1953; country: Panama; locality: Cerro Campana; eventDate: 08-24-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/165>; sex: Female; catalogNumber: BMNHE1722046; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Colombia, Costa Rica, Panama, Peru

Notes: Valid species in *Warileya*.

***sallesi* Galvão & Coutinho, 1939**

Nomenclature:

Flebotomus sallesi Galvão & Coutinho, 1939 (Galvão and Coutinho 1939)

Material*Paratype:*

- a. scientificName: *Evandromyia (Barrettomyia) sallesi* (Galvão & Coutinho, 1939); country: Brazil; stateProvince: São Paulo; municipality: Araçatuba; year: 1935; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/188>; sex: Female; catalogNumber: BMNHE1722069; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Argentina, Bolivia, Brazil, Ecuador, Paraguay, Peru

Notes: Valid species in *Evandromyia (Barrettomyia)*.

scorzai Ortiz, 1965**Nomenclature:**

Phlebotomus scorzai Ortiz, 1965 (Ortíz 1965)

Material*Paratype:*

- a. scientificName: *Lutzomyia (Helcocyrtomyia) scorzai* (Ortiz, 1965); country: Venezuela; locality: Rancho Grande; year: 1965; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/191>; sex: Male; catalogNumber: BMNHE1722072; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Peru, Venezuela

Notes: Valid species in *Lutzomyia (Helcocyrtomyia)*.

shawi Fraiha, Ward & Ready, 1981**Nomenclature:**

Lutzomyia shawi Fraiha, Ward & Ready, 1981 (Fraiha et al. 1981)

Materials*Paratypes:*

- a. scientificName: *Nyssomyia shawi* (Fraiha, Ward & Ready, 1981); country: Brazil; stateProvince: Pará; municipality: Marabá; locality: Serra dos Carajás; year: 1975; month: 2; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/88>; sex: Male; catalogNumber: BMNHE1251316; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Nyssomyia shawi* (Fraiha, Ward & Ready, 1981); country: Brazil; stateProvince: Pará; municipality: Marabá; locality: Serra dos Carajás; eventDate: 09-22-74; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/89>; sex: Female; catalogNumber: BMNHE1251317; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Nyssomyia shawi* (Fraiha, Ward & Ready, 1981); country: Brazil; stateProvince: Pará; municipality: Marabá; locality: Serra dos Carajás; year: 1975; month: 2; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/180>; sex: Male;

catalogNumber: BMNHE1722061; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

- d. scientificName: *Nyssomyia shawi* (Fraiha, Ward & Ready, 1981); country: Brazil; stateProvince: Pará; municipality: Marabá; locality: Serra dos Carajás; eventDate: 09-23-74; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/181>; sex: Female; catalogNumber: BMNHE1722062; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Nyssomyia shawi* (Fraiha, Ward & Ready, 1981); country: Brazil; stateProvince: Pará; municipality: Marabá; locality: Serra dos Carajás; eventDate: 09-23-74; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/184>; sex: Female; catalogNumber: BMNHE1722065; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Peru

Notes: Valid species in *Nyssomyia*.

***spinicrassa* Morales, Osorno-Mesa, Osorno & Hoyos, 1969**

Nomenclature:

Lutzomyia spinicrassa Morales, Osorno-Mesa, Osorno & Hoyos, 1969 (Morales et al. 1969)

Materials

Paratypes:

- a. scientificName: *Pintomyia (Pifanomyia) spinicrassa* (Morales, Osorno-Mesa, Osorno & Hoyos, 1969); country: Colombia; stateProvince: Boyacá; locality: Guayatá - Chitavita; eventDate: 08-09-68; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/213>; sex: Female; catalogNumber: BMNHE1722094; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Pintomyia (Pifanomyia) spinicrassa* (Morales, Osorno-Mesa, Osorno & Hoyos, 1969); country: Colombia; stateProvince: Boyacá; locality: Guayatá - Chitavita; eventDate: 08-09-68; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/214>; sex: Male; catalogNumber: BMNHE1722095; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Pintomyia (Pifanomyia) spinicrassa* (Morales, Osorno-Mesa, Osorno & Hoyos, 1969); country: Colombia; stateProvince: Boyacá; locality: Guayatá - Chitavita; eventDate: 08-09-68; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/250>; sex: Female; catalogNumber: BMNHE1722131; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Pintomyia (Pifanomyia) spinicrassa* (Morales, Osorno-Mesa, Osorno & Hoyos, 1969); country: Colombia; stateProvince: Boyacá; locality: Guayatá - Chitavita; eventDate: 08-09-68; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/251>; sex: Female; catalogNumber: BMNHE1722132; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Venezuela

Notes: Valid species in *Pintomyia (Pifanomyia)*.

strictivilla* Young, 1979*Nomenclature:**

Lutzomyia strictivilla Young, 1979 (Young 1979)

Material**Paratype:**

- a. scientificName: *Lutzomyia (Helcocyrtomyia) strictivilla* Young, 1979; country: Colombia; stateProvince: Antioquia; municipality: Zaragoza; locality: 24km SW of Zaragoza at Rio Anori; eventDate: 04-14-71; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/128>; sex: Male; catalogNumber: BMNHE1722009; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Ecuador, Venezuela

Notes: Valid species in *Lutzomyia (Helcocyrtomyia)*.

trapidoi* Fairchild & Hertig, 1952*Nomenclature:**

Phlebotomus trapidoi Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Materials**Paratypes:**

- a. scientificName: *Nyssomyia trapidoi* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Bocas del Toro; locality: Almirante, Finca Nievecita; eventDate: 06-21-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/86>; sex: Male; catalogNumber: BMNHE1251314; institutionCode: NHMUK
- b. scientificName: *Nyssomyia trapidoi* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 22/07/50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/179>; catalogNumber: BMNHE1722060; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua, Panama

Notes: Valid species in *Nyssomyia*.

trinidadensis* Newstead, 1922*Nomenclature:**

Phlebotomus trinidadensis Newstead, 1922 (Newstead 1922)

Materials**Syntypes:**

- a. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://>

- phlebotominaenhmtypes.myspecies.info/node/118; sex: Male; catalogNumber: BMNHE1721999; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/119>; sex: Female; catalogNumber: BMNHE1722000; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/120>; sex: Female; catalogNumber: BMNHE1722001; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/121>; sex: Male; catalogNumber: BMNHE1722002; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/122>; sex: Male; catalogNumber: BMNHE1722003; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- f. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/123>; sex: Female; catalogNumber: BMNHE1722004; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- g. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/124>; sex: Female; catalogNumber: BMNHE1722005; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- h. scientificName: *Micropygomyia (Sauromyia) trinidadensis* (Newstead, 1922); country: Trinidad and Tabago; eventDate: 01-07-22; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/125>; sex: Female; catalogNumber: BMNHE1722006; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Honduras, Mexico, Nicaragua, Peru, Panama, Surinam, Trinidad and Tobago, Venezuela

Notes: Valid species in *Micropygomyia (Sauromyia)*.

***triramula* Fairchild & Hertig, 1952**

Nomenclature:

Phlebotomus triramulus Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Materials

Paratypes:

- a. scientificName: *Trichopygomyia triramula* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Panamá; locality: Cerro Jefe, La Victoria; eventDate: 08-29-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/205>; sex: Female; catalogNumber: BMNHE1722086; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

- b. scientificName: *Trichopygomyia triramula* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Colón; locality: Palenque; eventDate: 09-15-49; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/206>; sex: Male; catalogNumber: BMNHE1722087; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Panama

Notes: Valid species in *Trichopygomyia*.

***ubiquitalis* Mangabeira, 1942**

Nomenclature:

Flebotomus ubiquitalis Mangabeira, 1942 (Mangabeira 1942)

Materials

Syntypes:

- a. scientificName: *Trichophoromyia ubiquitalis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aura; eventDate: 10-08-40; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/203>; sex: Male; catalogNumber: BMNHE1722084; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Trichophoromyia ubiquitalis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aura; eventDate: 10-08-40; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/204>; sex: Male; catalogNumber: BMNHE1722085; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Trichophoromyia ubiquitalis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aura; eventDate: 10-08-40; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/245>; sex: Male; catalogNumber: BMNHE1722126; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Trichophoromyia ubiquitalis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aura; eventDate: 10-08-40; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/246>; sex: Male; catalogNumber: BMNHE1722127; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Trichophoromyia ubiquitalis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aura; eventDate: 10-08-40; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/247>; sex: Male; catalogNumber: BMNHE1722128; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- f. scientificName: *Trichophoromyia ubiquitalis* (Mangabeira, 1942); country: Brazil; stateProvince: Pará; municipality: Belém; locality: Aura; eventDate: 10-08-40; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/259>; sex: Male; catalogNumber: BMNHE1722140; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Peru, Surinam, Venezuela

Notes: Valid species in *Trichophoromyia*.

***umbratilis* Ward & Fraiha, 1977**

Nomenclature:

Lutzomyia umbratilis Ward & Fraiha, 1977 (Ward and Fraiha 1977)

Materials

Paratypes:

- a. scientificName: *Nyssomyia umbratilis* (Ward & Fraiha, 1977); country: Brazil; stateProvince: Pará; locality: Rio Jari, Monte Dourado; eventDate: 06/02/76; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/177>; sex: Female; catalogNumber: BMNHE1722058; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Nyssomyia umbratilis* (Ward & Fraiha, 1977); country: Brazil; stateProvince: Pará; locality: Rio Jari, Monte Dourado; eventDate: 12/11/76; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/178>; sex: Female; catalogNumber: BMNHE1722059; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, French Guiana, Peru, Surinam, Venezuela

Notes: Valid species in *Nyssomyia*.

***vexillarius* Fairchild & Hertig, 1952**

Nomenclature:

Phlebotomus vexillarius Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Material

Paratype:

- a. scientificName: *Lutzomyia* (*Lutzomyia*) *vexillarius* (Fairchild & Hertig, 1952); acceptedNameUsage: *Lutzomyia* (*Lutzomyia*) *lichyi* (Floch & Abonnenc, 1950); country: Panama; stateProvince: Panamá; locality: Serrania majé, Cerro Chucanti; eventDate: 03-05-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/146>; sex: Male; catalogNumber: BMNHE1722027; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Brazil, Colombia, Costa Rica, Ecuador, French Guiana, Panama, Peru, Trinidad and Tobago, Venezuela

Notes: Synonym of *Lutzomyia* (*Lutzomyia*) *lichyi* (Floch & Abonnenc, 1950) Floch and Abonnenc 1950. Synonymised by Floch and Kramer 1965.

viriosa Fairchild & Hertig, 1958**Nomenclature:**

Phlebotomus viriosa Fairchild & Hertig, 1958 (Fairchild and Hertig 1958a)

Materials**Paratypes:**

- a. scientificName: *Dampfomyia (Coromyia) viriosa* (Fairchild & Hertig, 1958); country: Panama; stateProvince: Bocas del Toro; locality: near camp No.1, Almirante; eventDate: 05-17-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/139>; sex: Female; catalogNumber: BMNHE1722020; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Dampfomyia (Coromyia) viriosa* (Fairchild & Hertig, 1958); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 03-24-52; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/140>; sex: Male; catalogNumber: BMNHE1722021; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Dampfomyia (Coromyia) viriosa* (Fairchild & Hertig, 1958); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 09-17-52; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/141>; sex: Female; catalogNumber: BMNHE1722022; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Dampfomyia (Coromyia) viriosa* (Fairchild & Hertig, 1958); country: Panama; stateProvince: Bocas del Toro; locality: near camp No.1, Almirante; eventDate: 05-17-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/142>; sex: Male; catalogNumber: BMNHE1722023; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Dampfomyia (Coromyia) viriosa* (Fairchild & Hertig, 1958); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 09-09-52; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/143>; sex: Female; catalogNumber: BMNHE1722024; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- f. scientificName: *Dampfomyia (Coromyia) viriosa* (Fairchild & Hertig, 1958); country: Panama; stateProvince: Bocas del Toro; locality: near camp No.1, Almirante; eventDate: 05-17-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/144>; sex: Male; catalogNumber: BMNHE1722025; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Costa Rica, Panama

Notes: Valid species in *Dampfomyia (Coromyia)*.

walkeri Newstead, 1914**Nomenclature:**

Phlebotomus walkeri Newstead 1914 (Newstead 1914)

Phlebotomus gastii Sherlock, 1962

Materials

Lectotype:

- a. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/218>; sex: Male; catalogNumber: BMNHE1722099; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Paralectotypes:

- a. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/219>; sex: Male; catalogNumber: BMNHE1722100; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/220>; sex: Female; catalogNumber: BMNHE1722101; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- c. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/221>; sex: Female; catalogNumber: BMNHE1722102; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- d. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); country: Brazil; stateProvince: State of Rondonia; locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/252>; sex: Male; catalogNumber: BMNHE1722133; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- e. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); country: Brazil; stateProvince: State of Rondonia; locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/254>; sex: Male; catalogNumber: BMNHE1722135; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- f. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); country: Brazil; stateProvince: State of Rondonia; locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/255>; sex: Male; catalogNumber: BMNHE1722136; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- g. scientificName: *Evandromyia* (*Aldamyia*) *walkeri* (Newstead, 1914); country: Brazil; stateProvince: State of Rondonia; locality: Rio Abuna, Brazil/Boliva border; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/256>; sex: Male; catalogNumber: BMNHE1722137; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Panama, Peru, Trinidad and Tobago, Venezuela

Notes: Valid species in *Evandromyia* (*Aldamyia*). Lectotype designated by Lewis 1967b.

xerophila* Young, Brener & Wargo, 1983*Nomenclature:**

Lutzomyia xerophila Young, Brener & Wargo, 1983 (Young et al. 1983)

Material**Paratype:**

- a. scientificName: *Pintomyia xerophila* (Young, Brener & Wargo, 1983); country: USA; stateProvince: California; municipality: Riverside; locality: Cahuilla Hills, Palm desert; eventDate: 09-16-81; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/224>; sex: Female; catalogNumber: BMNHE1722105; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: United States of America

Notes: Valid species in *Pintomyia* (*incertae sedis*).

ylephiletor* Fairchild & Hertig, 1952*Nomenclature:**

Phlebotomus ylephiletor Fairchild & Hertig, 1952 (Fairchild and Hertig 1952)

Materials**Paratypes:**

- a. scientificName: *Nyssomyia ylephiletor* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Bocas del Toro; locality: Almirante, Finca Nievecita; eventDate: 06-22-50; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/87>; sex: Male; catalogNumber: BMNHE1251315; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Nyssomyia ylephiletor* (Fairchild & Hertig, 1952); country: Panama; stateProvince: Bocas del Toro; locality: Almirante; eventDate: 06-29-51; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/90>; sex: Female; catalogNumber: BMNHE1251318; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Belize, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama

Notes: Valid species in *Nyssomyia*.

yuilli* Young & Porter, 1972*Nomenclature:**

Lutzomyia yuilli Young & Porter, 1972 (Young and Porter 1972)

Materials

Paratypes:

- a. scientificName: *Nyssomyia yuilli* (Young & Porter, 1972); country: Colombia; stateProvince: Antioquia; municipality: Zaragoza; locality: 24km S & 21 km W of Zaragoza; eventDate: 23/05/70; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/175>; sex: Male; catalogNumber: BMNHE1722056; institutionCode: NHMUK; basisOfRecord: Preserved Specimen
- b. scientificName: *Nyssomyia yuilli* (Young & Porter, 1972); country: Colombia; stateProvince: Antioquia; municipality: Zaragoza; locality: 24km S & 21 km W of Zaragoza; eventDate: 12/09/70; eventRemarks: <http://phlebotominaenhmtypes.myspecies.info/node/176>; sex: Female; catalogNumber: BMNHE1722057; institutionCode: NHMUK; basisOfRecord: Preserved Specimen

Distribution: Bolivia, Brazil, Colombia, Ecuador, Peru, Venezuela

Notes: Valid species in *Nyssomyia*.

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Author contributions

PHFS: inspected type material, imaged specimens and assisted in manuscript writing. ZJOA: compiled data, created website, verified records and wrote manuscript.

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